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ABSTRACT

It has become recognized that major health problems are caused, precipitated, exacerbated, or maintained by lifestyle factors such as exercise, diet, and consumption of psychoactive substances. The introduction of complex behavior change into the medical prescription for health promotion and disease prevention has resulted in a large body of research demonstrating that the rates of compliance have been inadequate. Three models of compliance appearing recently in the literature include radical behavioral, cognitive, and cognitive-behavioral models. Although the cognitive-behavioral model is the most comprehensive of the three, it fails to integrate variables related to compliance to other known principles of behavior so that few predictions can be made from this model. However, development of this model into a paradigmatic behavioral theory may permit the generation of more specific hypotheses and thereby encourage the unification of our understanding of the causes of compliance and noncompliance to health care. This paradigmatic behavioral theory approaches the problem of compliance as a function of past learning experiences which have resulted in personality deficits, current antecedents to the compliant behavior, and current consequences, which in turn affect the adequacy of the personality repertoires. (ABL)

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A Paradigmatic Behavioral Perspective of Noncompliance to Health Regimens

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We are all familiar with what has come to be called the health care revolution which is taking place in this country (Matarazzo, 1984). One aspect of the changes in our health care system is a shift of responsibility for health status from being completely within the hands of the health care provider to being shared by the patient. It has become recognized that each of the top ten major health problems in this country are ones which are caused, precipitated, exacerbated or maintained by lifestyle factor. Chronic degenerative diseases of the lung and heart and many forms of cancer have been linked to individual differences in lifestyle (Matarazzo, 1984). Therefore, prevention and treatment prescriptions for these diseases often include

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modification in daily habits such as exercise, diet, and consumption of psychoactive substances such as caffeine, nicotine and alcohol in addition to adhering to medication and other more traditional medical treatments.

The introduction of complex behavior change into the medical prescription for health promotion and disease prevention has resulted in a large body of research demonstrating that the rates of compliance to such prescriptions have been inadequate. Noncompliance to health prescriptions not only interfers with the potential benefit of the treatment but also precludes obtaining an adequate sample of participants in much treatment outcome research. For example, compliance rates for short-term prescriptions are generally reported as 70 to 80% when the treatment is symptom-relieving and as 60 to 70% when the treatment is preventive (Sackett & Snow, 1979). Compliance rates to long-term regimens, as in taking lifetime medication or making lifelong diet changes, are often less than 50% by six months (Haynes, 1979a,b). These compliance rates hold across various demographic indicators such as gender, age, ethnicity, and socioeconomic class; they also hold for all degrees of symptom severity (DiMatteo & DiNicola, 1982). These rates reflect compliance when the health prescription was offered without also assessing and training the patient in the skills necessary for the prescribed behavioral change. In this respect, from the

perspective of a behavioral scientist and clinical psychologist,it is somewhat impressive that such a high percentage of individuals actually do change their behavior following little more than an instruction to do so.

The notion that noncompliance to a health regimen is an abnormal and changeworthy behavior is a relatively new one. One indicator that noncompliance to health prescriptions may constitute a reason for behavioral intervention is the inclusion of at least two diagnostic codes in the third edition of the Diagnostic and Statistical Manual (DSM-III;APA, 1980) which label noncompliance as a "mental disorder". For example, a diagnosis of Tobacco Dependence is made if a tobacco user continues to use tobacco for over a month after learning that such use exacerbates a serious physical disorder. DSM-III also includes a diagnosis called Psychological Factors Affecting Physical Condition which refers to any behavior which can be associated with the precipitation or worsening of a physical disorder.

Another indicator that noncompliance to a health regimen is now sometimes being viewed as changeworthy is the enormous burgeoning of theory and research in this area in the past thirty years. A decade ago, this research had included an atheoretical, shotgun approach to the investigation of over 200 variables as

possible predictors of compliance to a wide variety of health regimens (Haynes, Taylor, & Sackett, 1979). A recent review of this compliance literature concluded that while there is at least correlational evidence to implicate about two dozen of these variables in the prediction of compliance, much of the research has mixed findings (Heiby & Carlson, in press). This is not surprising because most of the studies evaluating determinants of compliance were guided by radical behavioral or cognitive theories which isolate unitary environmental, behavioral or demographic factors without consideration of an interaction among these variables. Therefore, individual differences in response to instructional health prescriptions are little understood. Until we can identify the determinants of health compliance, there is little to guide the health professional in the assessment of compliance problems and in the treatment and prevention of noncompliance.

Perhaps the unitary approach to the study of compliance has dominated research methodology over the past decade because there has been no adequate theoretical framework to guide hypothesis testing. It is the purpose of this paper to very briefly review and critique three representative models of compliance and to offer a paradigmatic (Staats, 1981) behavioral theory of compliance which hopefully begins to address those criticisms.

MODELS OF COMPLIANCE

Models of compliance which have appeared recently in the literature can be characterized as radical behavioral (e.g.,Melamed & Siegel, 1980), cognitive (e.g.,Health Belief Model;Becker & Maiman,1975a,b), and cognitive-behavioral (The Health Maintenance Model;Heiby & Carlson, in press). The radical behavioral model has stimulated research on the role of discriminative stimuli and environmental consequences in the prediction of compliance but has failed to accommodate findings suggesting individual differences exist in response to these environmental factors. For example, praise from a significant other functions as a reinforcement for compliance only for some individuals (DiMatteo & DiNicola, 1982). And oral instructions simply describing the desired lifestyle change are sufficient for only up to half of the people given such medical prescriptions. Cognitive models seem to make the opposite omission. These models have focused on the role of individual differences in the perception of susceptibility to the health problem, and expected outcome for compliance without consideration of other personality factors or of the actual consequences of compliance or noncompliance. One cognitive-behavioral model offered recently by Carlson and myself addressed the omissions of the radical behavioral and cognitive models by including environmental antecedent and consequential variables, perception of susceptibility and outcome, and numerous other empirically

supported variables that had been omitted from prior models of health compliance. This eclectic, cognitive-behavioral model is more comprehensive than prior radical behavioral or cognitive models of health compliance, but it fails to integrate the variables related to compliance to other known principles of behavior so that few specific hypotheses are generated from the model. The variables catalogued in this cognitive-behavioral model are presented in Figure 1.

As can be seen from this Figure, only very general predictions are made from this eclectic model. The model predicts compliance is affected by having salient discriminative stimuli to set the stage for the compliant behavior, more reinforcement than punishment following compliance, and the perceptions and beliefs which facilitate recognizing those antecedents and consequences. I am suggesting that the development of this model into a paradigmatic behavioral theory may permit the generation of more specific hypotheses and thereby encourage the unification of our understanding of the causes of compliance and noncompliance to health care.

THE PARADIGMATIC BEHAVIORAL THEORY OF COMPLIANCE

A brief sketch of the paradigmatic behavioral theory of compliance to health regimens appears in Figure 2. Because the prior papers in this symposium have already described the general characteristics of paradigmatic behaviorism, I will review only the components of the theory which relate specifically to our understanding of compliance.

The paradigmatic behavioral theory approaches the problem of compliance as a function of past learning experiences which have resulted in personality deficits, current antecedents to the compliant behavior, and current consequences which ,in turn ,affect the adequacy of the personality repertoires.

In Figure 2, S1 represents the hypothesized role of past learning in the development of adequate skills for assuming responsible health care behavior. In general,this past learning would include the conditioning of positive emotions and attitudes to health-related stimuli and the conditioning of negative emotions and attitudes to disease related stimuli, the acquisition of language which functions to provide discriminative stimuli and reinforcement forhealth compliance, and the sensory-motor skills necessary to carry out the compliant behavior. One example of deficient past learning would be

association of the sick role with social acceptance, as in the child who is directly reinforced for sickness by receiving special attention from parents only while ill or the child who observes a significant model being reinforced for engaging in a sick role under the same contingencies. Another example of deficient past learning would be exposure to significant model who expresses the belief that health is a product of fate and openly disregards health recommendations. The paradigmatic behavioral theory of compliance predicts that several hierarchical learning experiences may result in a deficiency of skills necessary to adhere to a prescribed health-related lifestyle.

The personality characteristics of the individual lacking in the skills necessary for altering one's lifestyle have been simply catalogued in models of health compliance such as the one proposed by Carlson and myself (Heiby & Carlson, in press). The paradigmatic behavioral theory of compliance classifies behavioral repertoires according to function. A functional classification of variables allows an analysis of the role of personality in the prediction of compliance under a particular circumstance. And because the three functional repertoires are potentially involved in all complex behavior, the theory provides a focus for the exploration of each proposed function.

First,the language-cognitive repertoire involves those variables which are best understood in terms of language acquisition and maintenance principles. The paradigmatic behavioral theory explicitly encourages the integration of research in areas such as semantic conditioning (Staats, Gross, Guay & Carlson, 1973), information processing, problem solving (Staats, 1963), and social cognition. The acknowledgement of a massive literature demonstrating that language can control motor and emotional behavior via discriminative and reinforcing functions may facilitate the understanding of the role of variables such as internal health locus of control (Hart, 1982). What is the function of this belief in the determination of health compliance? The paradigmatic behavioral theory predicts that the beliefs involved in the words such as "I am responsible for my health" serve as discriminative stimuli for behaviors which will be reinforced by the consequences of health compliance and thus may be considered part of a verbal-motor repertoire. On the other hand, the individual whose language-cognitive repertoire includes words such as "I am completely in the care of my doctor" may be lacking in the verbal-motor repertoire necessary to provide discriminative stimuli for health compliance. Therefore, treatment for noncompliance may benefit from including training in the acquisition of beliefs which function as discriminative stimuli for health promoting behaviors.

Another example of a variable in the language-cognitive repertoire is that of "labels disease severe" (Haefer & Kirscht, 1970). Within paradigmatic behaviorism, this variable is considered to be part of the verbal-emotional repertoire because the words elicit negative emotions via past conditioning. The theory predicts that words such as "lung cancer spells death" will function as punishers for noncompliance and negative reinforcers for compliance. Interestingly, just as the operant literature has found that simple behavior change can be more effective via positive reinforcement (Ferster & Skinner, 1957), similar findings are reported in the more complex compliance literature. Attempts to use scare tactics for health compliance frequently have been reported as ineffective (Kelly, 1979). Therefore, treatment for noncompliance may be more effective if it involved the acquisition of beliefs such as "my doctor is competent". This belief in theory would be part of the verbal-motor repertoire in that it may guide health compliant behaviors and part of the verbal-emotional repertoire in that these words are likely conditioned to elicit feelings positive feelings and attitudes which facilitate health compliance.

The second basic behavioral repertoire, the emotional-motivational repertoire, has overlap with the language-cognitive repertoire as already mentioned. One purpose

of isolating this repertoire is to encourage the integration of the massive existing literature in classical and operant conditioning concerned with our knowledge of emotional behaviors that are related to health compliance. For example, the words "I am responsible for my health" must be conditioned to positive emotions in order to serve as directive and reinforcing stimuli for health compliance. Similarly, as the operant literature clearly shows, the behaviors involved in health compliance will be initiated and maintained if followed by reinforcing consequences. If the individual has positive emotional conditioning to health and thereby values health, compliance will more likely be maintained. The treatment implications include the higher order conditioning of the consequences of compliance to positive emotional stimuli that are within the control of the individual, such as generating images of clear pink lungs in the cigarette smoker.

The third repertoire, the sensory-motor, interestingly is not included in any of the major models of health compliance as a separate variable for consideration. Prescribed lifestyle changes sometimes involve the acquisition of complex new sensory-motor habits, such as monitoring glucose in the diabetic, developing exercise routines, and reducing anxiety. By separating personality into functional repertoires, the

paradigmatic behavioral theory of noncompliance highlights the need to consider the basic skills necessary to produce the compliant behavior. Similarly, this skill acquisition must be considered in the context of existing maladaptive incompatible sensory-motor repertoires. If the individual is skilled in the sick role, then the competitive nature of these skills may compromise attempts to train the individual health promoting habits.

Thus far, we have seen how early learning leads to the development of behavioral repertoires which may be deficient in the production of health compliance. The paradigmatic behavioral theory goes on to predict that it is differences in these repertoires which account for differences in compliance to the same prescribed health regimen. In addition, it is the interaction between behavioral repertoires and the situation surrounding the current health prescription which determines if the individual will learn the compliant behavior. The paradigmatic behavioral theory of health compliance expands upon the available models of health compliance by , once again, acknowledging that the existing operant and classical conditioning literature can be integrated with demonstrated situational predictors of health compliance. These situational variables can be functionally classified as discriminative and facilitating conditions. The discriminative conditions include ,

for example, providing the necessary instructions for carrying out the compliant behavior. If such instructions are to function as discriminative stimuli to a particular individual, however, it would be necessary in theory for the individual to label the instructions as useful in controlling health contingencies (i.e. internal health LOC in the language-cognitive repertoire), to experience positive affect associated with that label (proud of internal LOC beliefs in the emotional-motivational repertoire), and to have the skills necessary for conducting the health-related behavior in the sensory-motor repertoire. Facilitating conditions are considered to be those which function as discriminative stimuli for behaviors which are compatible with compliance. For example, if a prescribed medication is too large to swallow, discriminative stimuli and requisite skills for compliance become obviously ineffectual.

Finally, the paradigmatic behavioral theory acknowledges that the consequences of compliance will affect the personality repertoires and the probability of exhibiting compliance in similar situations in the future. These predictions match those proposed in the radical behavioral model with the exception of the concept of personality as a causative agent. In sum, the paradigmatic behavioral theory of health compliance proposes the integration of known predictors with other already established principles of behavior, including the three functional behavioral

repertoires.

EVALUATION

We are currently conducting three investigations of the paradigmatic behavioral theory of compliance. Two of these projects involve the prediction of compliance to dietary change and nicotine abstinence by comparing treatments derived from the radical behavioral model and the paradigmatic behavioral theory. The third involves assessment of the theory's variables in diabetics' compliance to complex behavioral prescriptions such as monitoring glucose levels, taking insulin, exercise and diet modification. The heuristic value of the paradigmatic behavioral theory will be determined partly by the outcome of these investigations.

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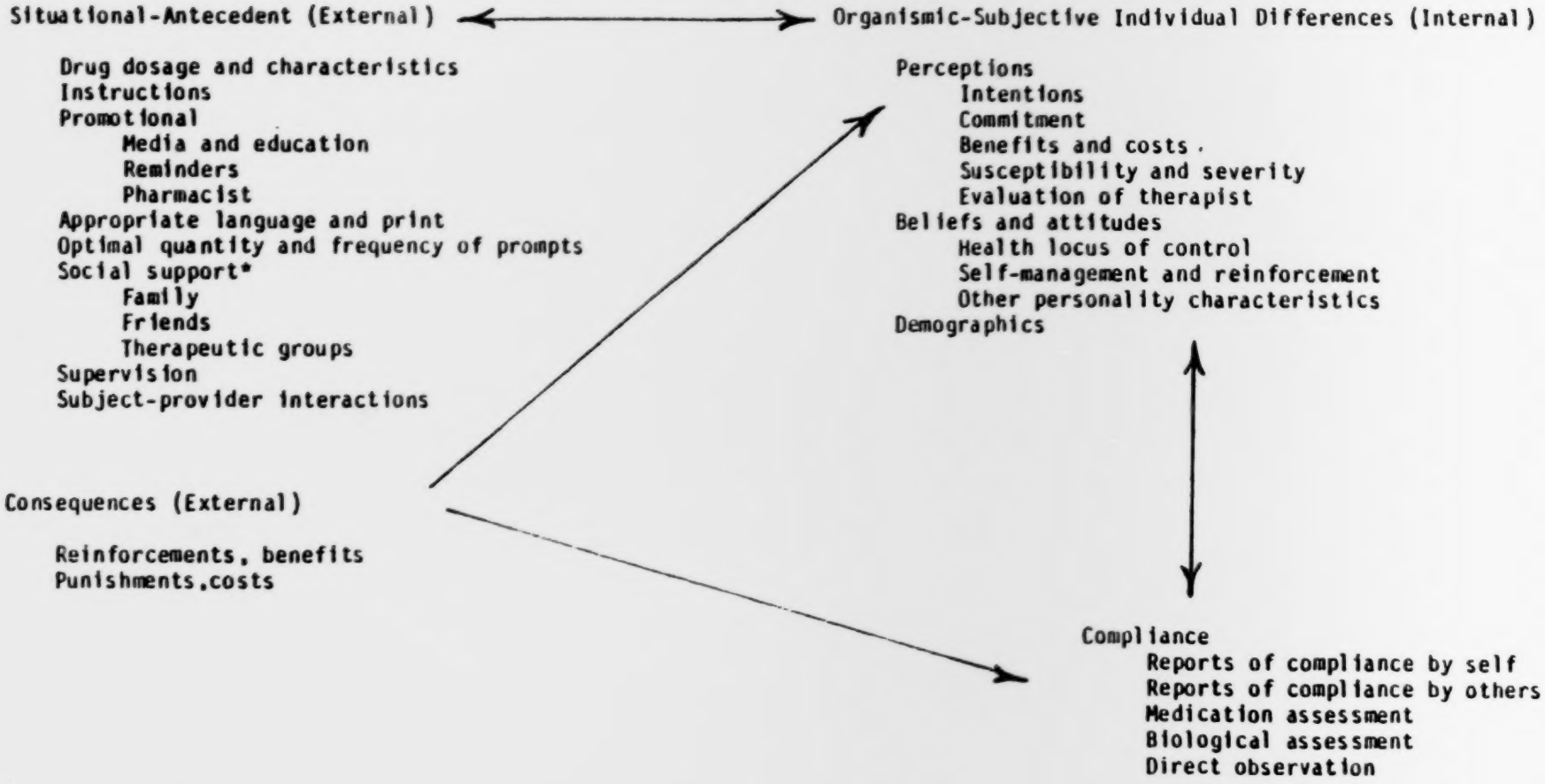
Figure 1

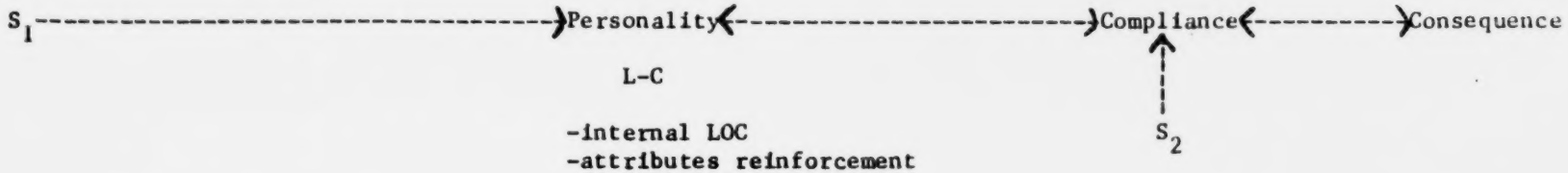
Components of the Health Cognition-Behavioral Model of Compliance



* social support can also function as a consequence to compliant behavior

Figure 2

THE PARADIGMATIC BEHAVIORAL THEORY OF HEALTH COMPLIANCE



L-C

-internal LOC
-attributes reinforcement
-labels self susceptible
-labels disease severe
-labels provider competent

E-M

-proud of internal LOC
-proud of compliance
-values health
-values provider
-anxious of sick role

S-M

-skills for health regimen
-skills incompatible for sick role

S_2

Facilitating conditions

-drug characteristics
-appropriate language and print
-positive behavior by provider

Discriminative stimuli

-instructions
-prompts(media,pharmacist,others)
-frequency of cues optimal

END

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